
Signaling pathways in induced naive pluripotency.

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Public Summary:

Pluripotent stem cells have become powerful tools for both research and regenerative medicine. To date, however, only mouse and rat embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs) have the ability to contribute to the formation of germline-competent chimeras. These stem cells are thus considered as 'naive' pluripotent stem cells. In this review, we discuss the signaling pathways that play a critical role in the induction and maintenance of this naive pluripotent state. Understanding how these pathways induce and maintain naive pluripotency will likely lead to the generation of germline-competent naive pluripotent stem cells from humans and animals phylogenetically close to humans.

Scientific Abstract:

Pluripotent stem cells have become powerful tools for both research and regenerative medicine. To date, however, only mouse and rat embryonic stem cells (ESCs)/induced pluripotent stem cells (iPSCs) have the ability to contribute to the formation of germline-competent chimeras. These stem cells are thus considered as 'naive' pluripotent stem cells. Several signaling pathways have been identified to play a critical role in the induction and maintenance of this naive pluripotent state. Understanding how these pathways induce and maintain naive pluripotency will likely lead to the generation of germline-competent naive ESCs/iPSCs from humans and animals phylogenetically close to humans.

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